NORTHWEST MOUNTAIN REGION RUNWAY INCURSION ACTION TEAM EVALUATION

Redmond Airport

November 27, 2001

Jim Greene

Regional Runway Safety Program Manager

Northwest Mountain Region
Federal Aviation Administration

Definition of Runway Incursion

Any occurrence at an airport involving:

- **an aircraft**
- **a vehicle**
- **a person**
- **or an object**

on the ground that creates a collision hazard or results in loss of separation with an aircraft taking off, intending to take off, landing, or intending to land.

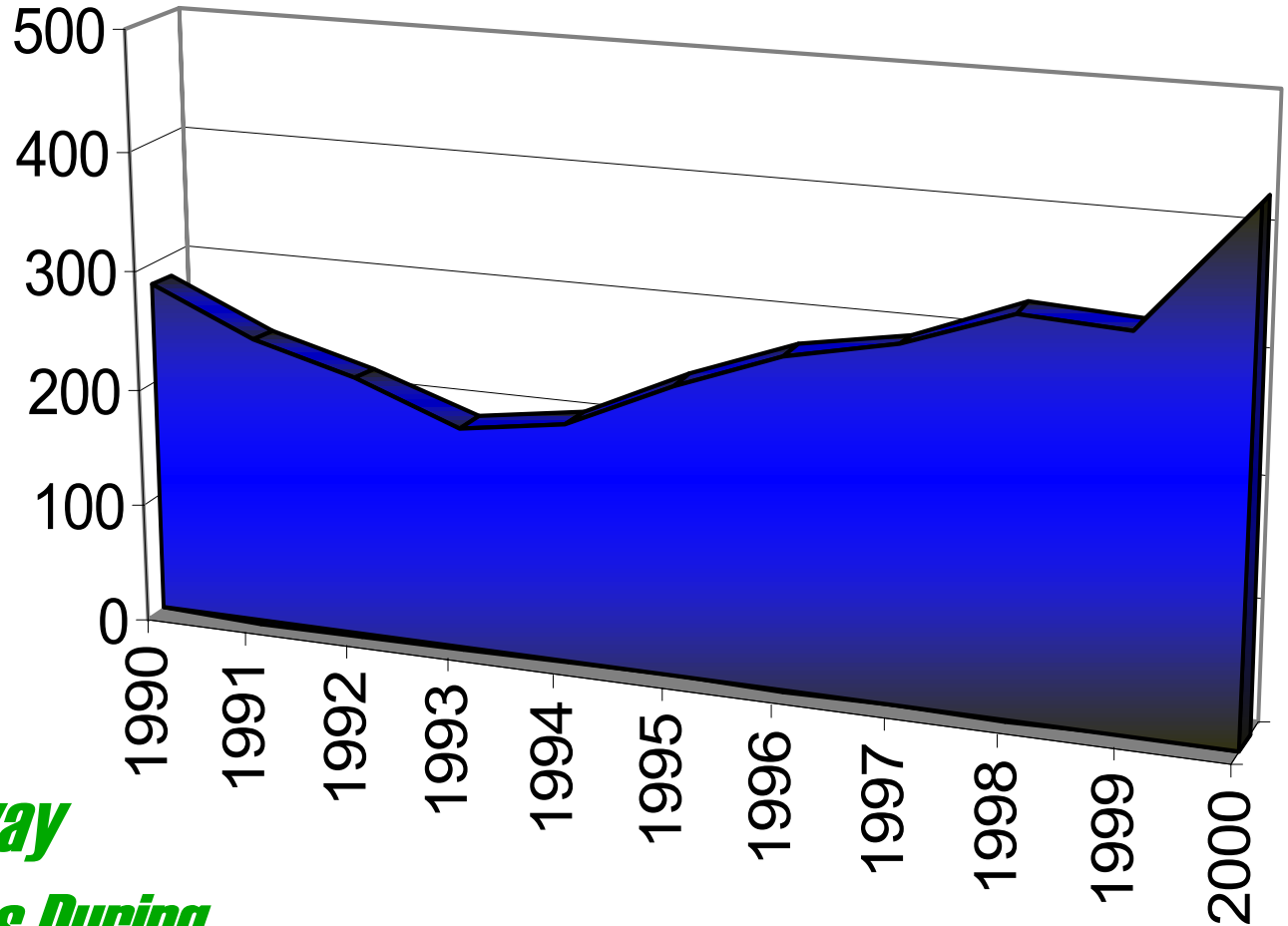
Sedan versus DC-10

Runway Incursion Types

Runway incursions result from three types of surface incidents:

- **Operational Errors (OE)**
- **Pilot Deviations (PD)**
- **Vehicle/Pedestrian Deviations (V/PD)**

Trends



431 Runway Incursions During CY 2000

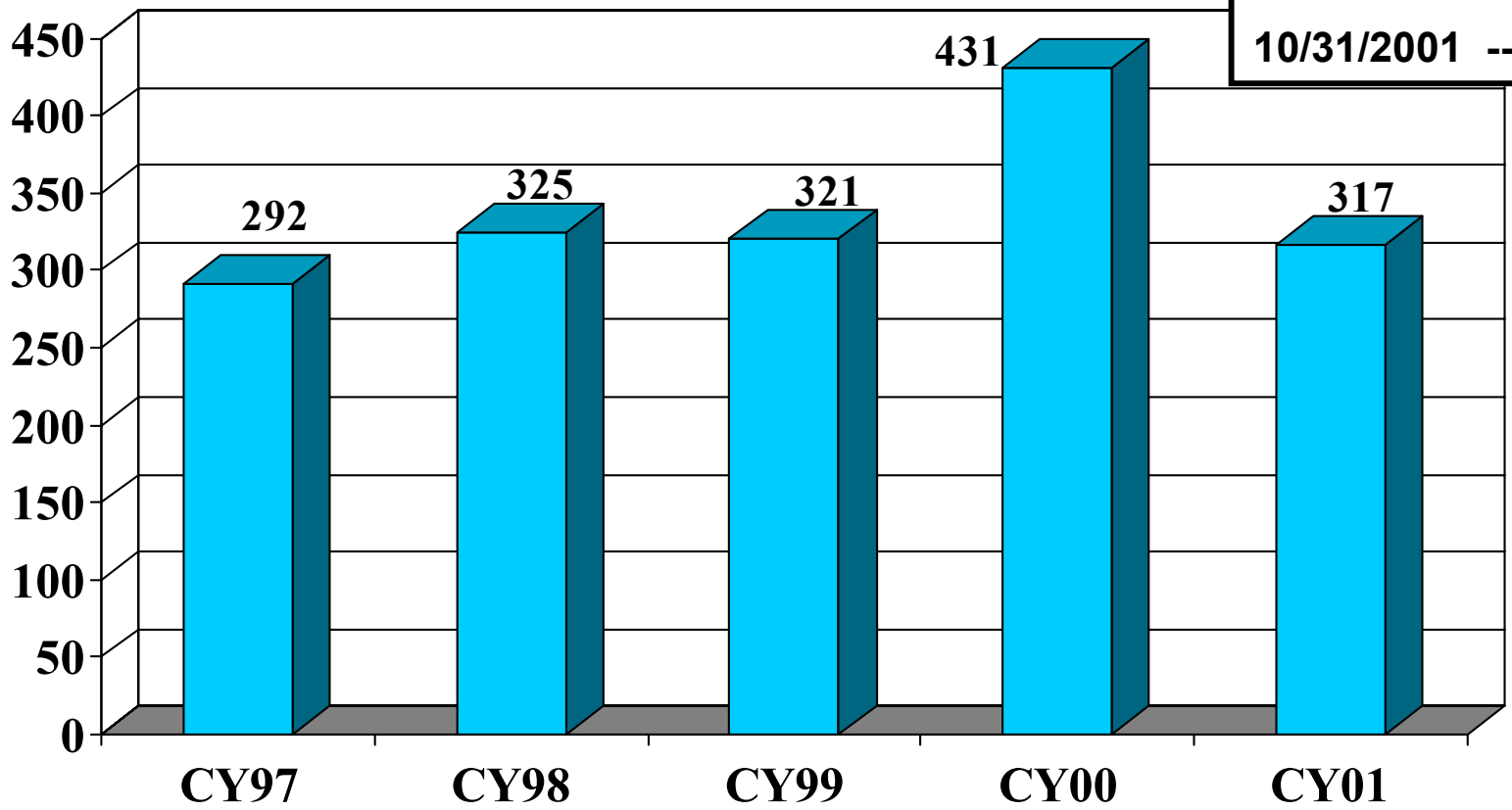
RUNWAY INCURSIONS

CY97 to DATE
(as of 10/31/01)

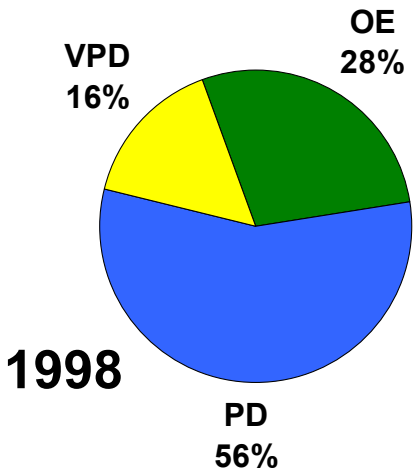
YTD Comparisons

10/31/2000 -- 366

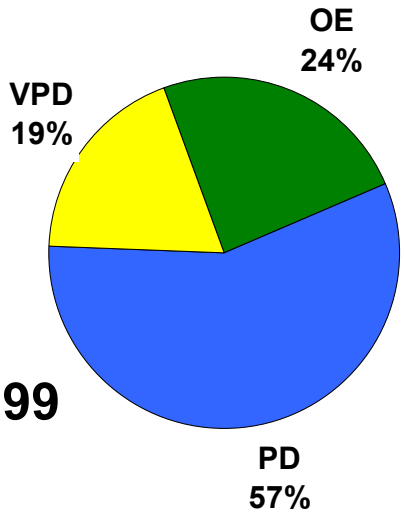
10/31/2001 -- 226



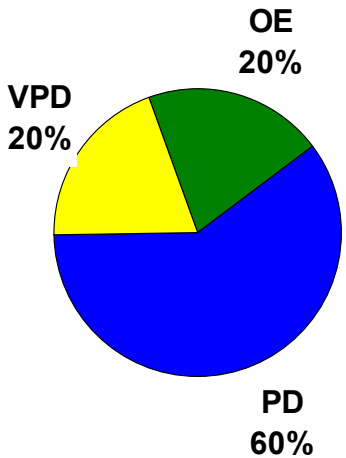
Trends - Incursions by type



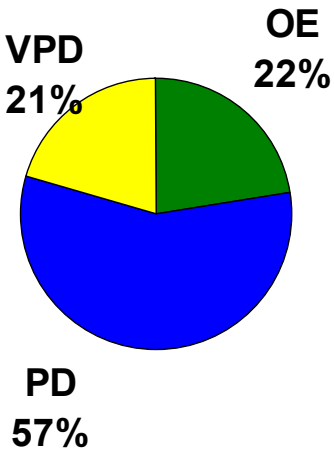
1998



1999



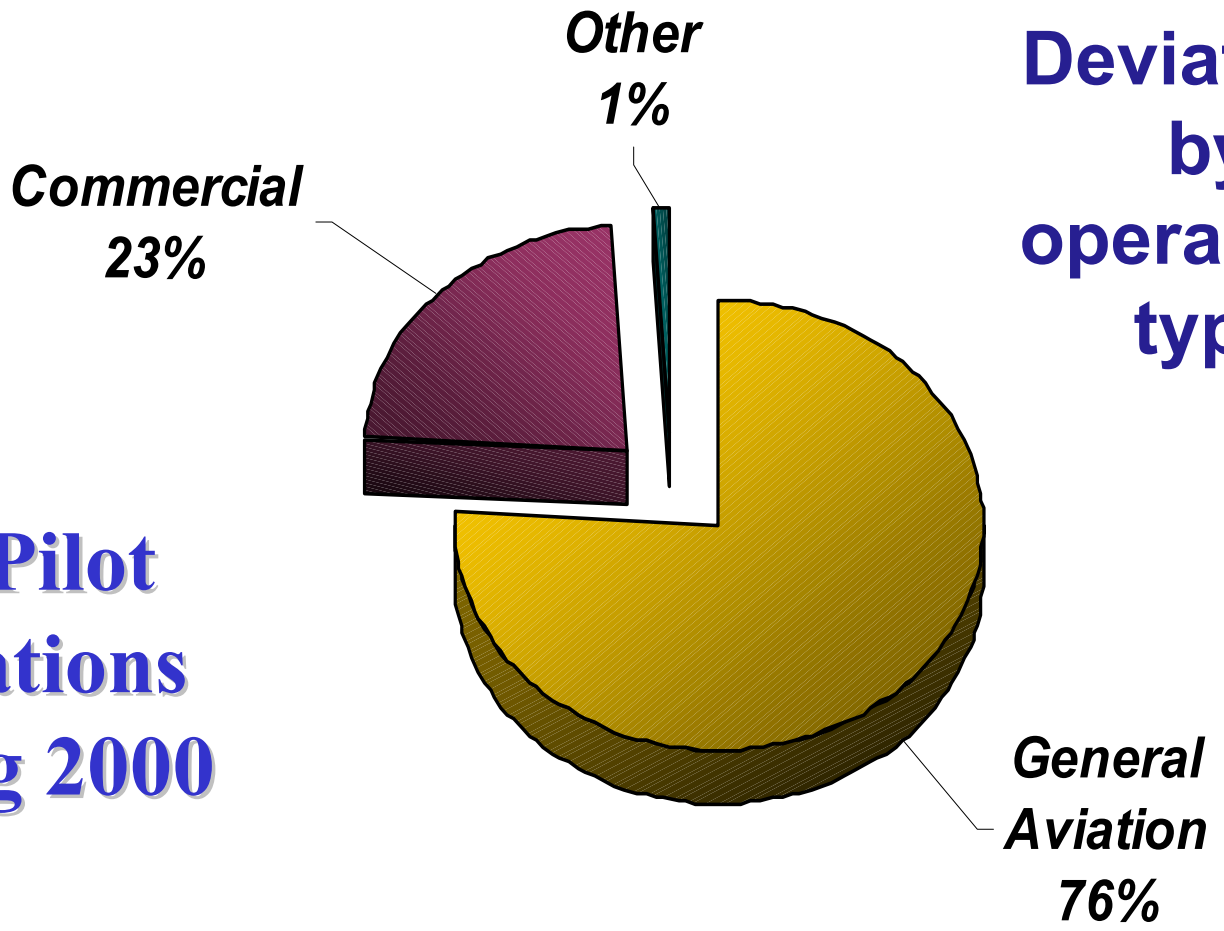
2000



Thru 31 Oct 2001

Trends

Pilot Deviations by operations type



256 Pilot Deviations during 2000

Top Incursion Airports

CY 2000

LOCATION	LOC ID	OPS	RI	RATE
North Las Vegas Arpt, NV	VGT	**229,703**	**16**	**6.97**
Montgomery Field/San Diego, CA	MYF	**260,235**	**9**	**3.46**
Fort Lauderdale Exec, FL	FXE	**263,359**	**9**	**3.42**
Merrill Field, Anchorage, AK	MRI	**201,148**	**8**	**3.98**
Long Beach Arpt, CA	LGB	**416,766**	**8**	**1.92**
Logan Arpt, Boston, MA	BOS	**512,985**	**8**	**1.56**
Los Angeles, CA	LAX	**786,421**	**8**	**1.02**
Jeffco Arpt, Denver, CO	BJC	**177,319**	**7**	**3.95**
Concord Arpt, CA	CCR	**212,112**	**7**	**3.30**
Orange Co/John Wayne Arpt, Santa Ana, CA	SNA	**405,473**	**7**	**1.73**
Santa Barbara, CA	SBA	**163,865**	**6**	**3.66**
Lambert Fld, St. Louis, MO	STL	**490,779**	**6**	**1.22**
Phoenix Sky Harbor Arpt, AZ	PHX	**632,360**	**6**	**0.95**
Troutdale Arpt, OR	TTD	**76,252**	**5**	**6.56**
Teterboro Arpt, NJ	TEB	**272,201**	**5**	**1.84**

Top Incursion Airports

CY 2000

LOCATION	LOC ID	OPS	RI	RATE
San Jose Arpt, CA	SJC	**300,365**	**5**	**1.67**
Bridgeport, CT	BDR	**90,760**	**4**	**4.41**
Greater Rockford Arpt, IL	RFD	**94,571**	**4**	**4.23**
McGhee Tyson Airport Knoxville, TN	TYS	**152,330**	**4**	**2.63**
Providence, RI	PVD	**157,470**	**4**	**2.54**
Sarasota/Bradenton Arpt, FL	SRQ	**174,515**	**4**	**2.29**
Palwaukee Muni, Chicago, IL	PWK	**185,236**	**4**	**2.16**
Albuquerque, NM	ABQ	**233,632**	**4**	**1.71**
Midway Arpt, Chicago, IL	MDW	**303,192**	**4**	**1.32**
Salt Lake City, UT	SLC	**370,681**	**4**	**1.08**
San Francisco, CA	SFO	**437,186**	**4**	**0.92**
Newark, NJ	EWR	**461,457**	**4**	**0.87**
Cincinatti-Covington Arpt, OH	CVG	**486,590**	**4**	**0.82**
O'Hare, Chicago, IL	ORD	**914,131**	**4**	**0.44**

Sweeper versus DC-9

RISK ASSESSMENT

Why We Assessed Data

- As a result of feedback from 2000 Summit, needed to place runway incursions into another context
- Need a better way to track incursions
- Need a better understanding of where incursions happen
- Need a way to analyze data to get at causal factors
- Need to describe clearer picture of runway incursion incidents – ***Not every incursion is a Tenerife***

Definitions

A Separation decreases to a point where the margin of safety is so low that the participants barely avoid a collision.*

B Separation decreases to a point where a significant potential for a collision existed.

C Separation decreases, or the potential for separation to decrease exists, but ample time and distance exist to avoid a potential collision.

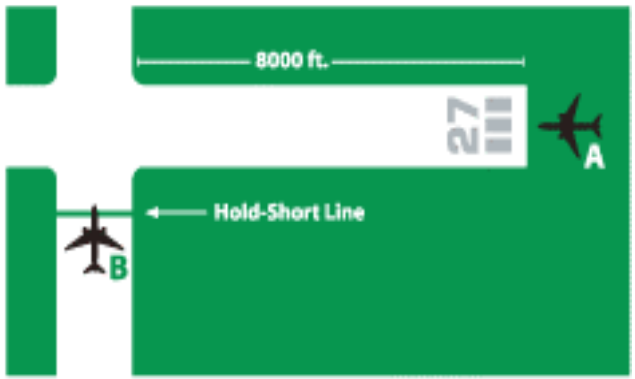
D Meets the definition of a runway incursion, with little or no risk of a collision.

* **The data contained in category A includes all accidents that occurred as a result of runway incursions (1997-2000), one in LaGuardia, NY & one in Sarasota, FL.**

Not all runway incursions are “created equal”

Case 1

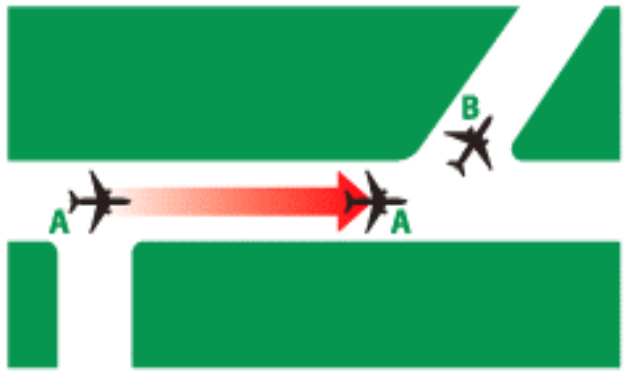
This incident meets the definition of a runway incursion, but there is little or no chance of collision.



- The potential for a collision is low
- Most frequently reported incursion

Case 2

This is a severe situation where the margin of safety is so low that a collision is barely avoided.



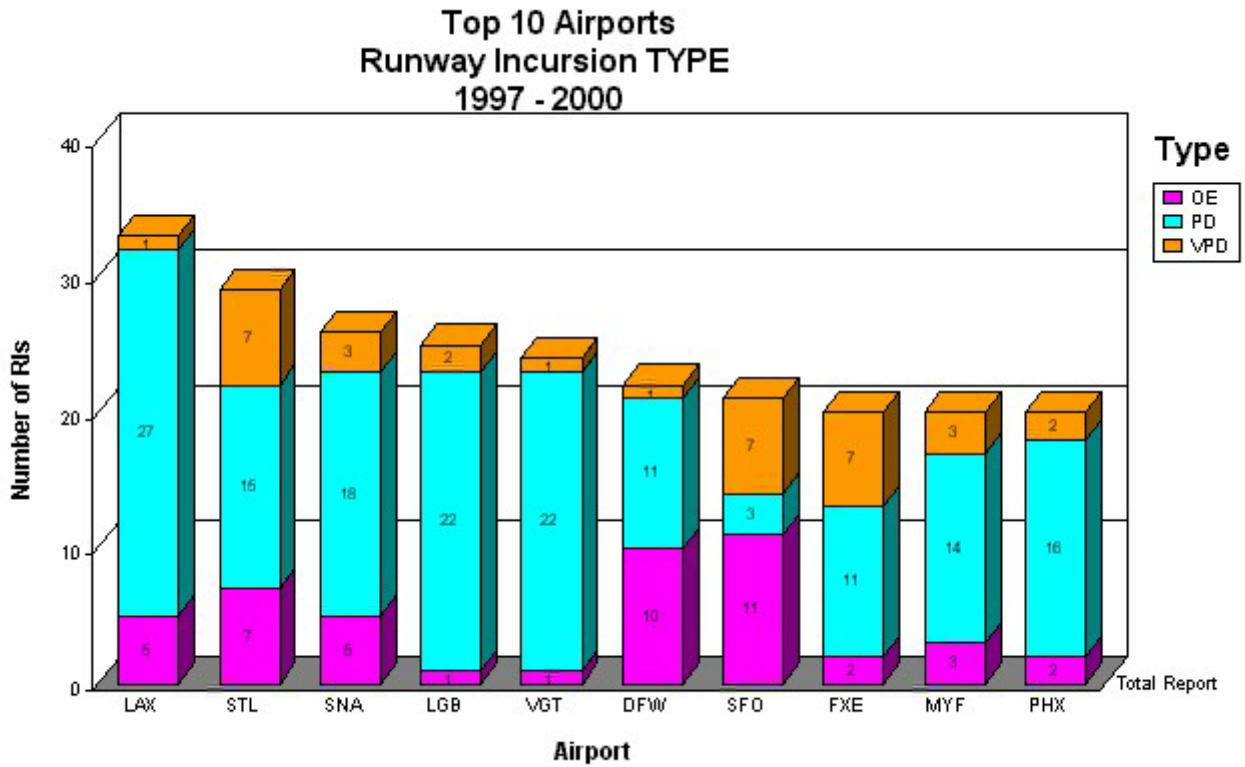
- Potential for a collision is high
- Typifies the common perception of a runway incursion
- More severe but less frequent

Runway Incursion Severity

The two simple cases illustrate that a variety of dimensions can dramatically impact the severity of a runway incursion.

Available Reaction Time	Evasive or Corrective Action	Environmental Conditions	Speed of Aircraft and/or Vehicle	Proximity of Aircraft and/or Vehicle

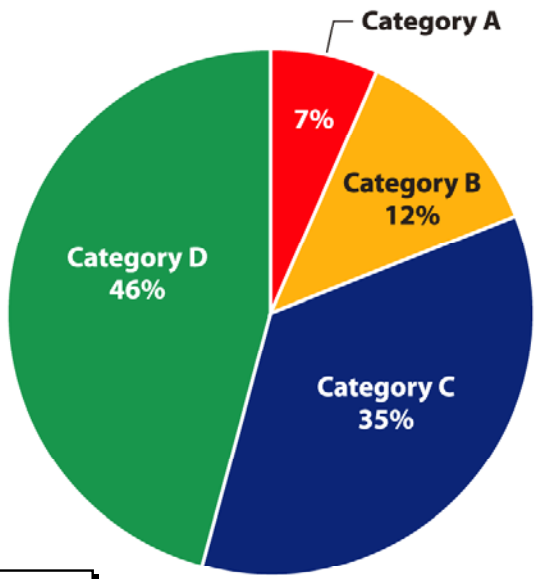
Category D	Category C	Category B	Category A	Accident
Little or no chance of collision but meets the definition of a runway incursion	Separation decreases but there is ample time and distance to avoid a collision	Separation decreases and there is a significant potential for collision	Separation decreases and participants take extreme action to narrowly avoid a collision	An incursion that resulted in a runway collision


Top 10 Airports
Runway Incursion TYPE
1997 - 2000
Number of RIs
40
30
20
10
0
Type
OE
PD
VPD
LAX
STL
SNA
LGB
VGT
DFW
SFO
FXE
MYF
PHX
Total Report
Airport

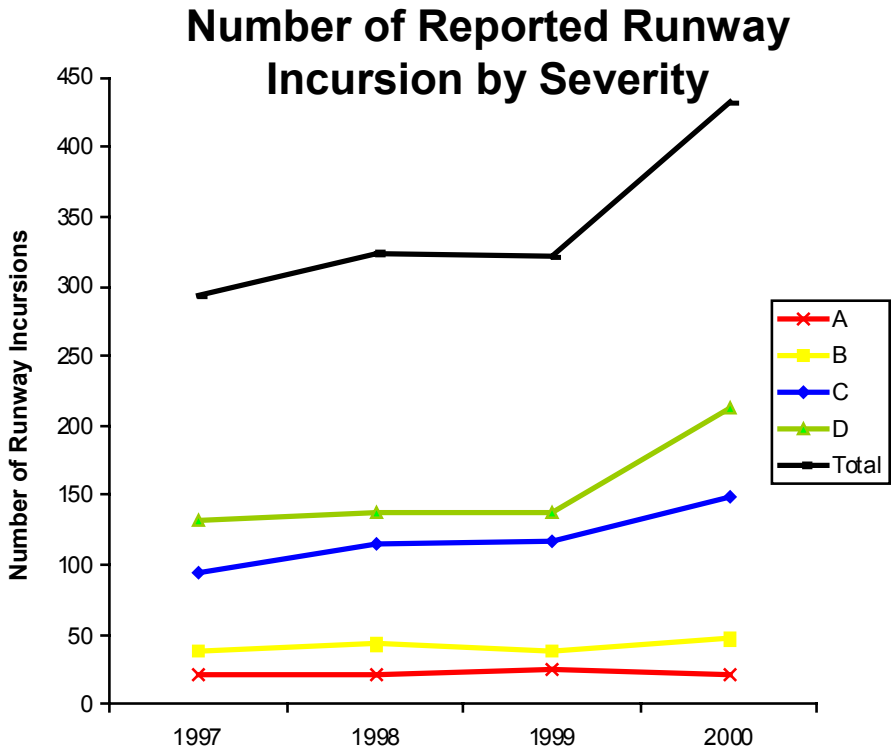
Number of Reported Runway Incursions by Severity

Figure 4.

Severity Distribution of Reported Runway Incursions 1997–2000



Total =1359



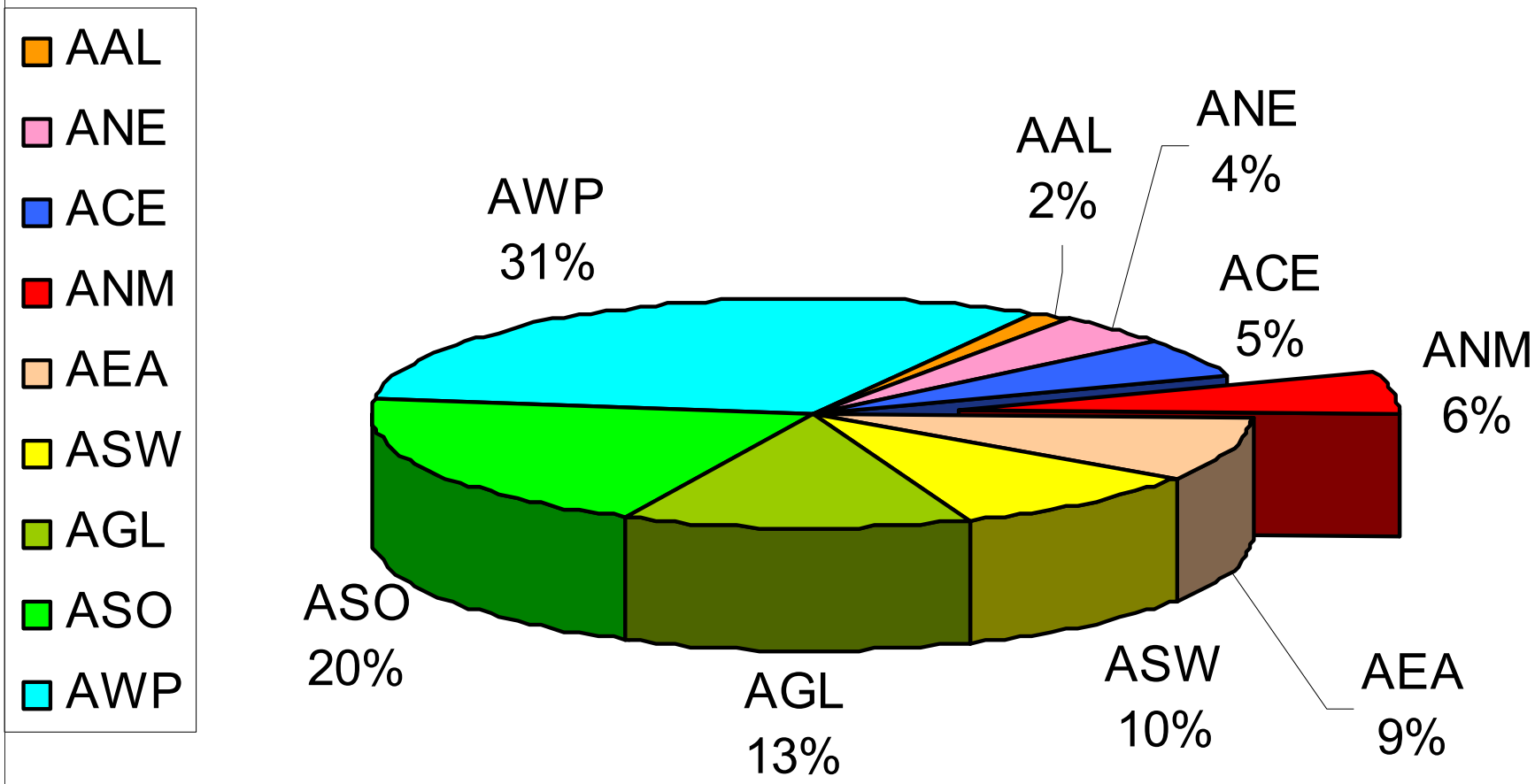
Note:

- *The total numbers are: 292, 325, 321, 431*
- *Accidents are listed as A events (1accident in 1997, 2 accidents in 2000)*
- *Does not include 10 events with insufficient data*

- The distribution of runway incursion severity categories from 1997 to 2000 indicates that the majority (81%) of the incidents was comprised of Category C & D events.

- There were 110 more reported runway incursions in 2000 than in 1999. Category C & D events accounted for 106 out of these 110 events.

% of Total Runway Incursions

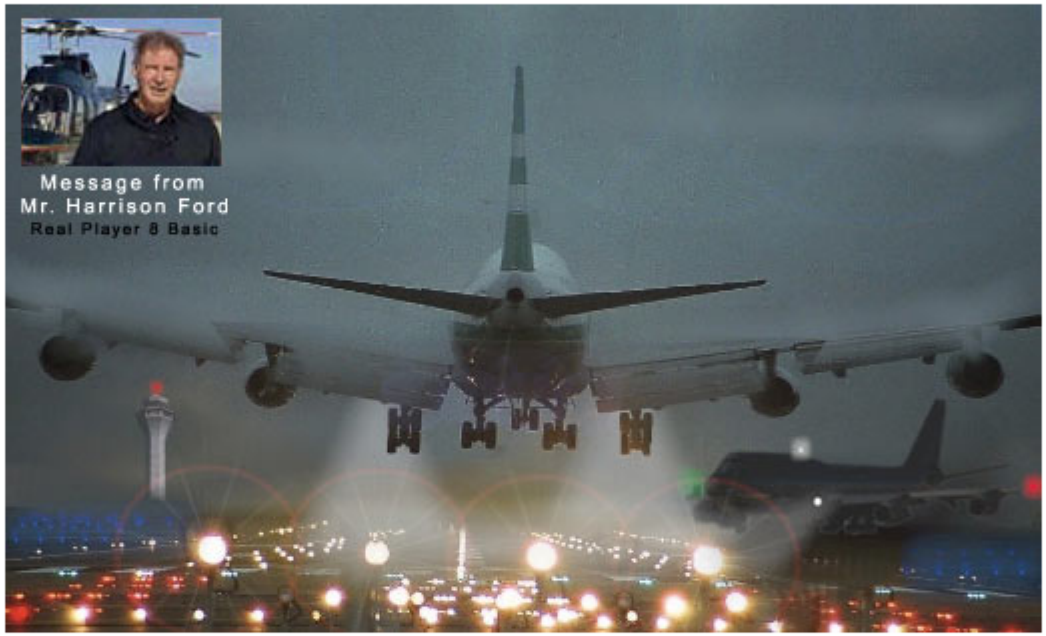


Primary Causes of Runway Incursions

- Breakdown in Pilot/Ground Vehicle/Controller Communications
- Lack of Airport Familiarity
- Loss of Situational Awareness

Snow Plow versus Wingtip

Runway Safety Program



Contact Webmaster Web Site Policy & Issues

99724

Runway Safety Program

what's new

FAA Runway Safety Report

The FAA has recently developed and published the National Blueprint for Runway Safety, which provides a structured plan to improve runway safety across the nation. The Blueprint outlines several initiatives aimed at increasing runway safety. As part of implementing the Blueprint, the FAA has analyzed the severity of runway incursions for the first time. This analysis of runway incursion severity trends at towered airports in the United States will help guide implementation of these safety-related initiatives. Download report...(link to report).

Options

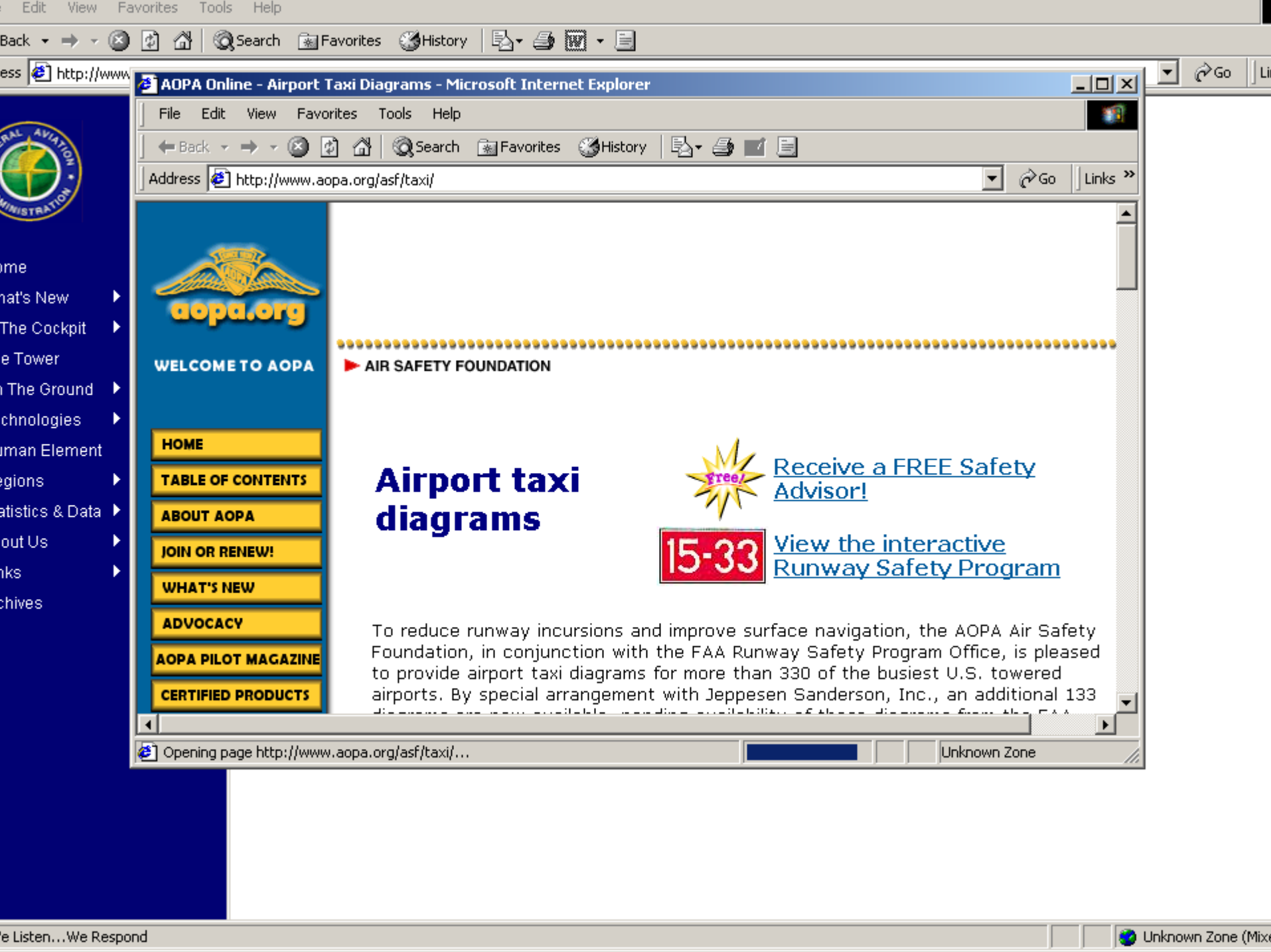
Driving on the Airport Operations Area

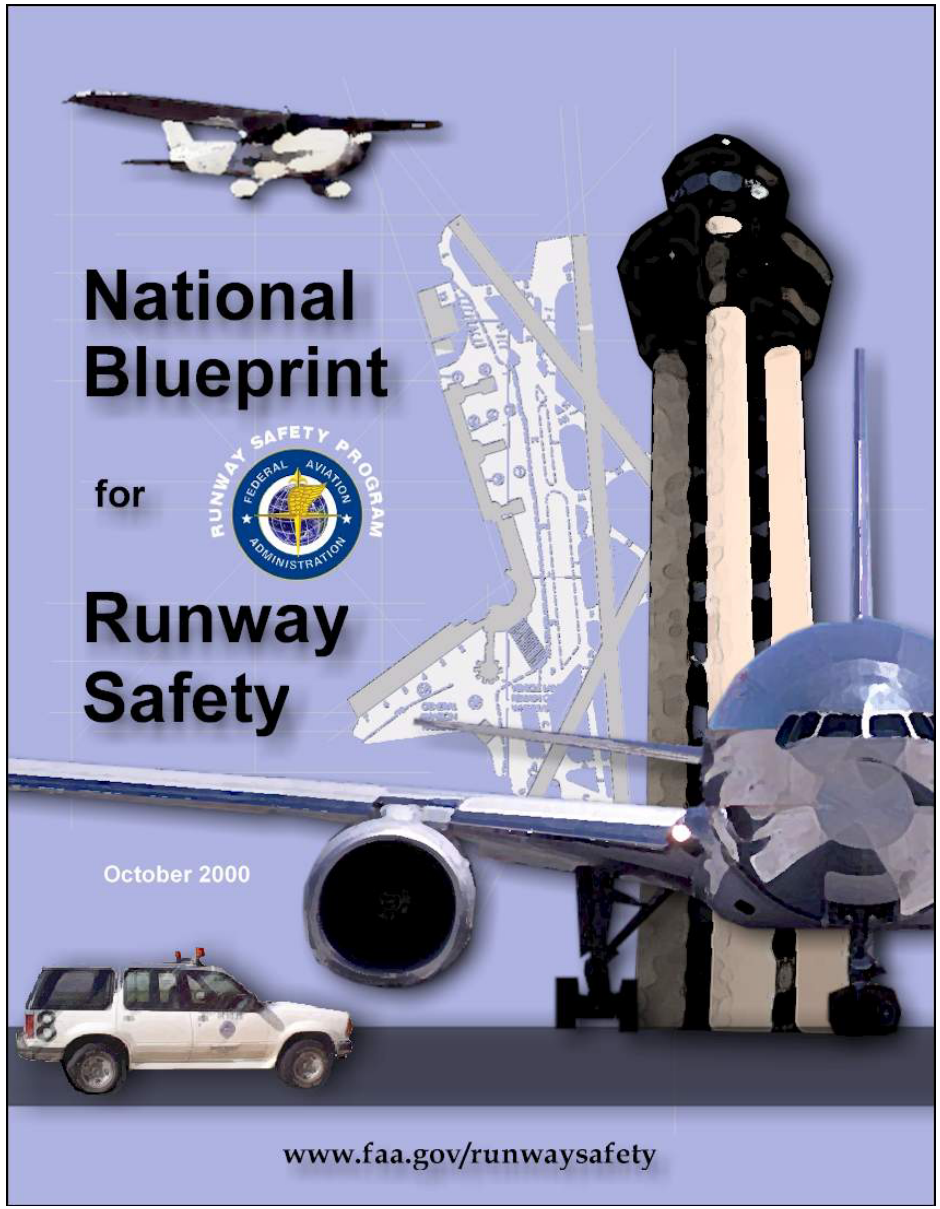
The video, "Driving on the Airport Operations Area," and the study guide are essential elements in improving communications and operations when driving on any airport operations area. While this training is geared toward tower-controlled airports, any person driving on airport premises can benefit from its content. The focus of these training materials is to enhance the safety of vehicle operations on the airfield.

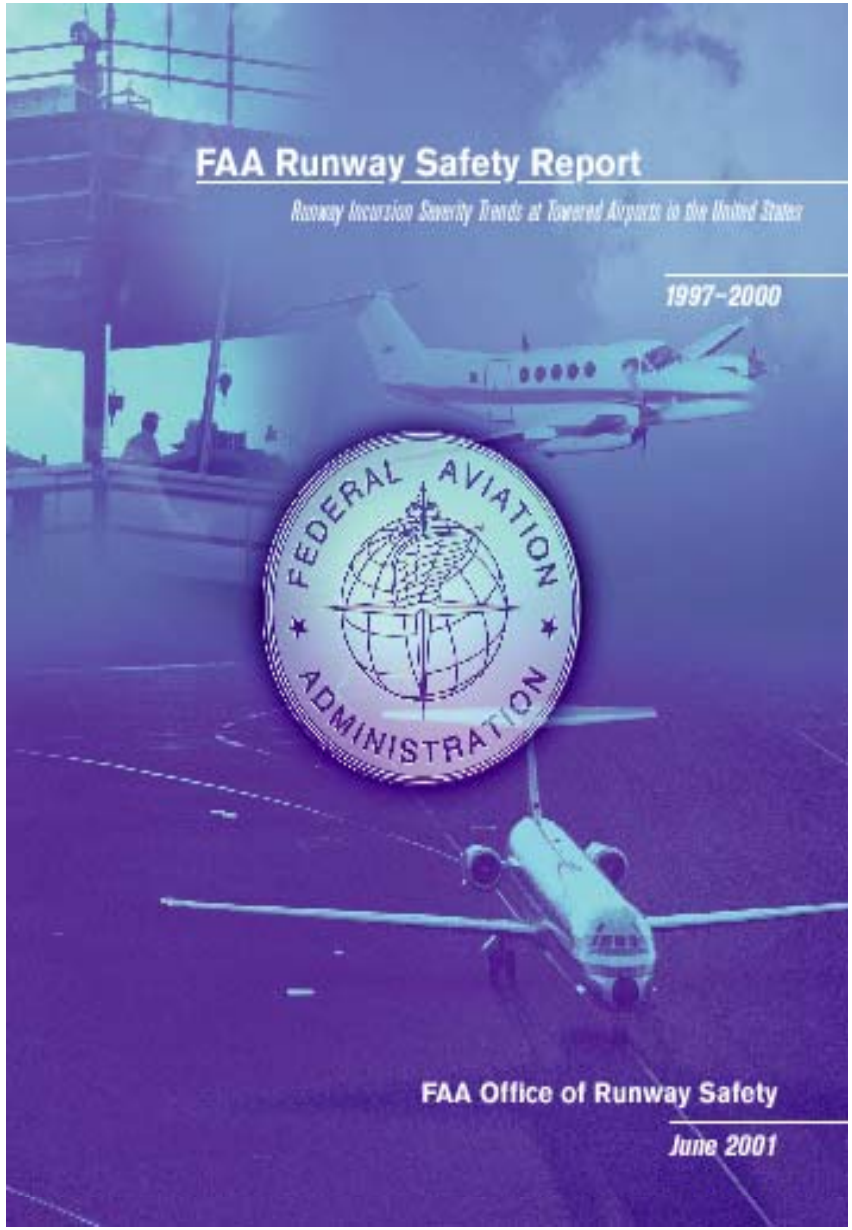
Options

National Blueprint for Runway Safety

The Runway Safety Program is pleased to present the National


AOPA Online - Airport Taxi Diagrams - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites History
Address http://www.aopa.org/asf/taxi/
Go Links
aopa.org
WELCOME TO AOPA
HOME
TABLE OF CONTENTS
ABOUT AOPA
JOIN OR RENEW!
WHAT'S NEW
ADVOCACY
AOPA PILOT MAGAZINE
CERTIFIED PRODUCTS
AIR SAFETY FOUNDATION
Airport taxi diagrams
free!
Receive a FREE Safety Advisor!
15-33
View the interactive Runway Safety Program
To reduce runway incursions and improve surface navigation, the AOPA Air Safety Foundation, in conjunction with the FAA Runway Safety Program Office, is pleased to provide airport taxi diagrams for more than 330 of the busiest U.S. towered airports. By special arrangement with Jeppesen Sanderson, Inc., an additional 133
Opening page http://www.aopa.org/asf/taxi/...
Unknown Zone


National
Blueprint
for
Runway
Safety
October 2000
www.faa.gov/runwaysafety


FAA Runway Safety Report
Runway Incursion Severity Trends at Towered Airports in the United States
1997–2000
FEDERAL AVIATION ADMINISTRATION
FAA Office of Runway Safety
June 2001

Airport Signs & Markings Quiz

Start Here

Place the number(s) of each sign or marking matching the description in the description box.
(Each sign or marking may be used once, more than once, or not at all.)

A. Indicates you are approaching a runway .....

B. Shows places you should not taxi an aircraft .....

C. Indicates you do, or may, need ATC approval to cross .....

D. Tells you the runway or taxiway you are on .....

E. Sign giving you directions to a runway, taxiway, or other airport destination .....

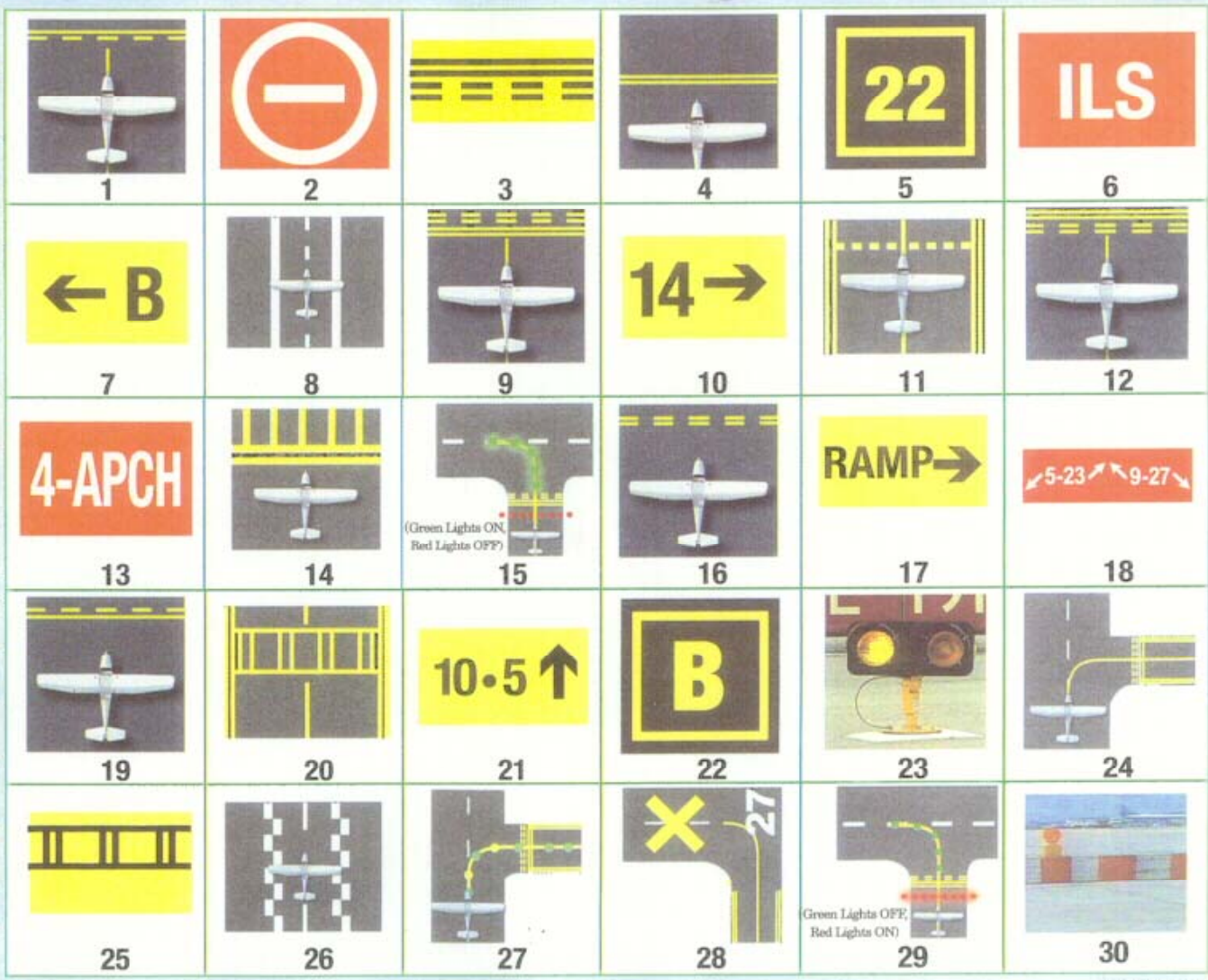
F. Indicates you're about to enter an area that could cause interference with an ILS signal .....

G. Helps you find your way off a runway .....

H. Confirms you are cleared onto a runway (tower - controlled airport) .....

I. Used to indicate you're about to cross a runway approach or departure path .....

J. Tells you where you should hold short of a crossing taxiway .....



FAA-P-8740-64
AFS-803 (2000)

U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject:	Date: 6/18/01	Initiated by: AFS-800	AC No: 91-73
PART 91 PILOT AND FLIGHTCREW PROCEDURES DURING TAXI OPERATIONS AND PART 135 SINGLE-PILOT OPERATIONS			Change:

1. PURPOSE. This advisory circular (AC) provides guidelines for the development and implementation of standard pilot procedures for conducting safe aircraft operations on the airport surface. It is intended for use by Title 14 of the Code of Federal Regulations (14 CFR) part 91 operators and part 135 operators conducting single pilot flight operations. These guidelines should become an integral part of all standard operating procedures, flight operations manuals, and formal training programs. Standard use of developed procedures should be emphasized during the certification and proficiency training of all pilots. The use of standard procedures for operating on the airport surface should further be emphasized during the flight review (refer to 14 CFR part 61, section 61.56) of all certificated pilots.

> **NOTE: Pilots operating aircraft under 14 CFR parts 121, 125, or 135 (those part 135 flight operations where 2 or more pilots are in the cockpit) refer to AC 120-XX, Part 121, 125, and 135 Flightcrew Procedures During Taxi Operations.**

2. FOCUS. This guidance focuses on the activities occurring on the flight deck/cockpit (e.g., planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g., climbing, descending, maneuvering). Although there are many similarities, taxi operations for single piloted aircraft, as opposed to taxi operations for aircraft that require more than one pilot, present distinct challenges and requirements. These distinct challenges are elaborated, when necessary, throughout the guidance. An additional section is provided concerning operations at airports without operating control towers. Finally, a section is devoted to the use of exterior aircraft lights in making an aircraft more conspicuous to all other persons directly involved in airport flight and ground operations.

3. RELATED READING MATERIAL. The following documents and web sites contain useful information regarding runway safety. FAA ACs can be found on

- Be aware
- Listen!
- Ask questions
- Stick to business
- ***STOP*** if in doubt
- Read back
- Once again ...

IF YOU DO NOT UNDERSTAND

ASK!

10 Ways To Help Prevent Runway Incursions

1 See The "Big Picture"
Monitor both ground and tower communications when possible.

2 Transmit Clearly
Make your instructions and read backs complete and easy to understand.

3 Listen Carefully
Listen to your clearance. Listen to what you read back. Do not let communications become automatic.

4 Copy Clearances
Clearances can change. Keep a note pad and copy your clearance. If needed refer to your notes.

5 Situational Awareness
Know your location. If unfamiliar with an airport keep a current airport diagram available for easy reference.

6 Admit When Lost
If you get lost on an airport ask ATC for help. Better to damage your pride than your airplane.

7 Sterile Cockpit
Maintain a sterile cockpit until reaching cruising altitude. Explain to your passengers that talking should be kept to a minimum.

8 Understand Signs, Lights And Markings
Keep current with airport signs, lights and markings. Know what they mean and what action to take.

9 Never Assume
Do not take clearances for granted. Look both ways before entering or crossing taxiways and runways.

10 Follow Procedures
Establish safe procedures for airport operations. Then follow them.

ANM Points of Contact

(ANM Runway Safety Team)

- ***Runway Safety Program Manager, ANM-1R, Jim Greene, (425) 227-1369 Jim.k.greene@faa.gov***
- ***Airports Division, ANM-600, Mark Taylor, (425) 227-2625 Mark.taylor@faa.gov***
- ***Flight Standards, ANM-200, Chuck Cox, (425) 227-2243 Chuck.Cox@faa.gov***
- ***Airway Facilities Operations, ANM-400, Willie Eigner, (425) 227-2336 Willie.eigner@faa.gov***
- ***Air Traffic Control, ANM-500, Don Bringmann, (425) 227-2550 Donald.bringmann@faa.gov***

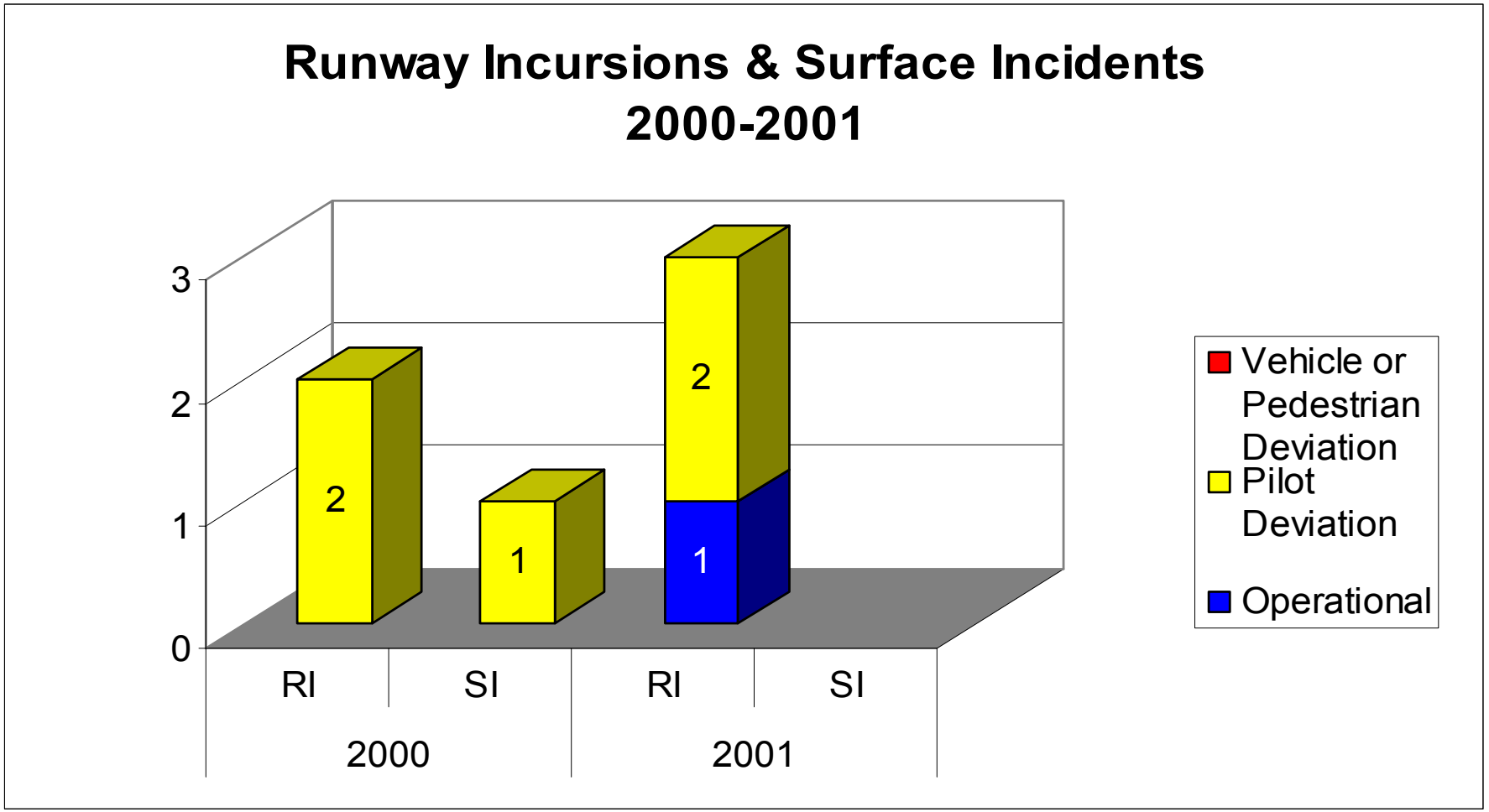
We Listen….

We Respond

Pickup Truck versus B-747

Local Problems require local Solutions

Redmond Airport




AIRCRAFT MOVEMENT AREA
STOP
DO NOT PROCEED
WITHOUT CLEARANCE
FROM PAINE TOWER
VEHICLES REQUIRE A
FLASHING AMBER BEACON

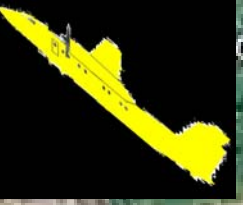

AIRCRAFT TAXIWAY
TOWER CLEARANCE REQUIRED

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

8/17/2000 PNMTRDM00001 PD - A C310 landed on Runway 22 without ATC clearance, losing runway separation with an E-120 landing on intersecting Runway 28. The C310 called Ground Control after landing.

8/18/2000 An RV-4 landed NORDO on Runway 28, taxied westbound on Taxiway G, taxied onto Taxiway D, and entered Runway 28 as a C-130 was on landing rollout.

6/7/2001 A Socata TBM-700 was instructed to "taxi to Runway 28, hold short at Taxiway F." After being prompted, the pilot readback the clearance correctly. The aircraft turned at Taxiway D, crossed the Runway 28 hold line, but held short of the runway. The local controller alerted the ground controller and, to avoid loss of separation, issued a go-around to a Dash-8 on a ¼-mile final Runway 28.




7/14/2001 A Cessna C185 was cleared for takeoff Runway 22; a Cessna C182 was departing on Runway 10 from approach end. The C182 was 1,000 feet down the runway when the C185 passed the intersection of Runway 22 and 10. Closest proximity was 2,000 feet horizontal separation.
Juniper Golf Course
Butler Aircraft
USDA Forest Service
Centurion Air
Redmond Air
AIC Tower
Air Carrier Terminal
Not Accessible to GA Aircraft
Runway 4/22
Runway 10/28
A
B
C
D
E
F
G
H
J
M
= Pilot Deviation
= Operational Error/Deviation
= Vehicle/Pedestrian Deviation

8/18/2001 PNMTRDM01002 C PD

Cessna C150 landed Runway 28 without contacting ATC for authorization. The aircraft was first sighted approximately 1 mile final Runway 28. A DC6, departing Runway 22, had rolled approximately 500 feet when its takeoff clearance was cancelled. An Embraer E120, on 1½ mile final for Runway 28 was sent around to avoid loss of separation. The Cessna stopped just short of Runway 22, then taxied to the north general aviation ramp (possibly in response to light gun signals). Pilot told controller he used frequency 123.6, info from pilots' guidebook. The closest proximity was 3,000 feet horizontal.

CAUTION: BE ALERT TO RUNWAY CROSSING CLEARANCES
READBACK OF ALL RUNWAY HOLDING INSTRUCTIONS IS REQUIRED.

WHY HAVE A GROUND VEHICLE TRAINING PROGRAM?

NM09FS-68

Accident Prevention Program

Aviation Safety-Education Meeting

BEND, OREGON

CENTRAL OREGON COMMUNITY COLLEGE

HITCHCOCK AUDITORIUM

TUESDAY NOVEMBER 27, 2001

7:00-9:00 PM

REDMOND AIRPORT OPERATIONS

AND

OPERATIONS AT NON TOWERED AIRPORTS

NO ADMISSION FEE

WINGS PROGRAM: A SPECIAL OPPORTUNITY FOR ALL PILOTS TO LEARN AND MEET BFR REQUIREMENTS

FEDERAL AVIATION ADMINISTRATION
KEITH CRIMIN
SAFETY PROGRAM MANAGER
1-800-847-3806-ext5512

OREGON PILOTS ASSN..
DEAN CAMERON
541-389-4433

Local Problems require local Solutions

- Redmond Airport Traffic Control Tower
- Redmond Airport